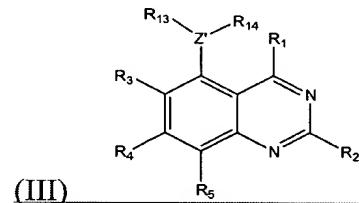
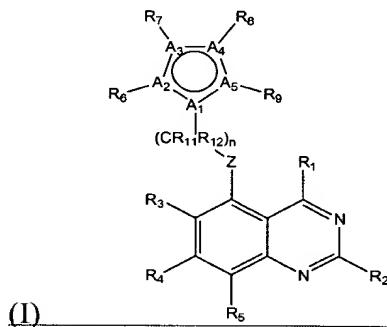


**Marked-up Paragraph:****RELATED APPLICATIONS**

This application is a divisional of U.S. Serial No. 09/971,682, filed May 1, 1998, now U.S. Patent No. 6,204,267, which, in turn, The present application claims priority to U.S. Serial Numbers 60/060,152, filed September 26, 1997, entitled METHODS OF MODULATING SERINE /THREONINE PROTEIN KINASE FUNCTION WITH QUINAZOLINE-BASED COMPOUNDS, by Tan et al. (Lyon & Lyon Docket No. 225/284) and 60/045,351, filed May 2, 1997, entitled METHODS OF MODULATING SERINE/THREONINE PROTEIN KINASE FUNCTION WITH 5-SUBSTITUTED QUINAZOLINE COMPOUNDS, by Tang et al. (Lyon & Lyon Docket No. 223/249), all of which are incorporated by reference herein in their entirety, including any drawings.

**Marked-up Claim:**

1. (Amended) A method of modulating the function of a serine/threonine protein kinase with a quinazoline-based compound ~~substituted five membered or six membered aryl or heteroaryl ring~~, comprising the step of contacting cells expressing said serine/threonine kinase with said compound, or a pharmaceutically acceptable salt thereof, wherein said compound has the formula set forth in formula I or III:



wherein:

- (a) Z is oxygen, NX<sub>1</sub>, or sulfur, where X<sub>1</sub> is selected from the group consisting of hydrogen, saturated or unsaturated alkyl, and five-membered or six-membered heteroaryl or six-membered aryl ring moieties;
- (b) n is 0, 1, 2, 3, or 4;
- (c) A<sub>1</sub>, A<sub>2</sub>, A<sub>3</sub>, A<sub>4</sub> and A<sub>5</sub> are independently selected from the group consisting of carbon, nitrogen, oxygen, and sulfur,

provided that if any of  $A_1$ ,  $A_2$ ,  $A_3$ ,  $A_4$  and  $A_5$  is nitrogen, oxygen, or sulfur, said  $A_1$ ,  $A_2$ ,  $A_3$ ,  $A_4$  and  $A_5$  is not substituted with  $R_6$ ,  $R_7$ ,  $R_8$  or  $R_9$ ;

(d)  $R_1$ ,  $R_2$ ,  $R_3$ ,  $R_4$ ,  $R_5$ ,  $R_6$ ,  $R_7$ ,  $R_8$  and  $R_9$  are independently selected from the group consisting of:

(i) hydrogen;

(ii) saturated or unsaturated alkyl;

(iii)  $NX_2X_3$ , where  $X_2$  and  $X_3$  are independently selected from the group consisting of hydrogen, saturated or unsaturated alkyl, and five-membered or six-membered heteroaryl or six-membered aryl ring moieties;

(iv) halogen or trihalomethyl;

(v) a ketone of formula  $-CO-X_4$ , where  $X_4$  is selected from the group consisting of hydrogen, alkyl, and five-membered or six-membered heteroaryl or six-membered aryl ring moieties;

(vi) a carboxylic acid of formula  $-(X_5)_{n5}-COOH$  or ester of formula  $-(X_6)_{n6}-COOX_7$ , where  $X_5$ ,  $X_6$ , and  $X_7$  and are independently selected from the group consisting of alkyl and five-membered or six-membered heteroaryl or six-membered aryl ring moieties and where  $n5$  and  $n6$  are each independently 0 or 1;

(vii) an alcohol of formula  $-(X_8)_{n8}-OH$  or an alkoxy moiety of formula  $-(X_8)_{n8}-OX_9$ , where  $X_8$  and  $X_9$  are independently selected from the group consisting of alkyl and five-membered or six-membered heteroaryl or six-membered aryl ring moieties and where  $n8$  is 0 or 1, and where said ring moieties are optionally substituted with one or more substituents selected from the group consisting of alkyl, halogen, trihalomethyl, carboxylate, and ester;

(viii)  $-NHCOX_{10}$ , where  $X_{10}$  is selected from the group consisting of alkyl, hydroxyl, and five-membered or six-membered heteroaryl or six-membered aryl ring moieties, wherein said ring moieties are optionally substituted with one or more substituents selected from the group consisting of alkyl, halogen, trihalomethyl, carboxylate, and ester;

(ix)  $-SO_2NX_{11}X_{12}$ , where  $X_{11}$  and  $X_{12}$  are selected from the group consisting of hydrogen, alkyl, and five-membered or six-membered heteroaryl or six-membered aryl ring moieties; and

(x) a five-membered or six-membered heteroaryl or six-membered aryl ring moiety optionally substituted with one or more substituents selected from the group consisting of alkyl, halogen, trihalomethyl, carboxylate, and ester moieties;

(e) any adjacent  $R_3$ ,  $R_4$ , and  $R_5$  or any adjacent  $R_6$ ,  $R_7$ ,  $R_8$ , and  $R_9$  are fused together to

form a five-membered or six-membered heteroaryl or six-membered aryl ring moiety, wherein said five-membered or six-membered heteroaryl or six-membered aryl ring comprises two carbon atoms of quinozaline ring to which R<sub>3</sub>, R<sub>4</sub>, and R<sub>5</sub> or R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub>, and R<sub>9</sub> are attached; and

(f) R<sub>11</sub> and R<sub>12</sub> are independently selected from the group consisting of

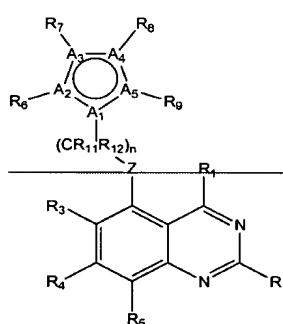
(i) hydrogen;

(ii) saturated or unsaturated alkyl; and

(g) Z' is carbon, oxygen, sulfur, or nitrogen and R<sub>13</sub> and R<sub>14</sub> taken together form a five-membered or six-membered heteroaryl ring with Z' as a ring member.

11. (Amended) The method of claim 1, wherein said quinazoline-based compound has the formula set forth in structure I, II, or III:

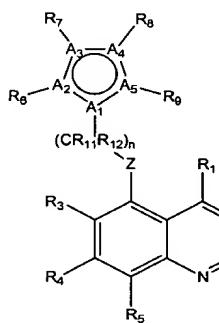
(I)



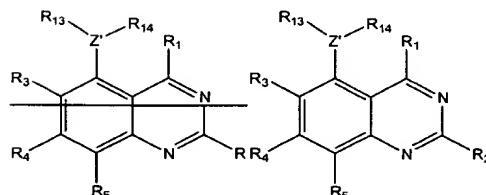
R<sub>8</sub>



(II)



(III)



wherein:

(a) Z is oxygen,  $NX_1$ , or sulfur, where  $X_1$  is selected from the group consisting of hydrogen, saturated or unsaturated alkyl;

(b) n is 0, 1, 2;

(c)  $A_1$ ,  $A_2$ ,  $A_3$ ,  $A_4$ , and  $A_5$ , and  $A_6$  are independently selected from the group consisting of carbon, nitrogen, oxygen, and sulfur,

provided that if any of  $A_1$ ,  $A_2$ ,  $A_3$ ,  $A_4$  and  $A_5$  is nitrogen, oxygen, or sulfur, said  $A_1$ ,  $A_2$ ,  $A_3$ ,  $A_4$  and  $A_5$  is not substituted with  $R_6$ ,  $R_7$ ,  $R_8$  or  $R_9$ ;

(d)  $R_1$  and  $R_2$  are independently selected from the group consisting of:

(i) hydrogen;

(ii) saturated or unsaturated alkyl;

(iii)  $NX_2X_3$ , where  $X_2$  and  $X_3$  are independently selected from the group consisting of hydrogen and saturated or unsaturated alkyl; and

(iv) halogen or trihalomethyl; and

(v) five-membered or six-membered heteroaryl ring moiety;

(e)  $R_3$ ,  $R_4$ ,  $R_5$ ,  $R_6$ ,  $R_7$ ,  $R_8$ , and  $R_9$ , and  $R_{10}$  are independently selected from the group consisting of:

(i) hydrogen;

(ii) saturated or unsaturated alkyl;

(iii)  $NX_4X_5$ , where  $X_4$  and  $X_5$  are independently selected from the group consisting of hydrogen and saturated or unsaturated alkyl; and

(iv) halogen or trihalomethyl; and

(v)  $-OX_7$ , where  $X_7$  is selected from the group consisting of hydrogen, saturated or unsaturated alkyl, and a five-membered or six-membered aryl or heteroaryl ring moiety;

(f) any adjacent  $R_3$ ,  $R_4$ , and  $R_5$  or any adjacent  $R_6$ ,  $R_7$ ,  $R_8$ , and  $R_9$ , and  $R_{10}$  are fused together to form a five-membered or six-membered aryl or heteroaryl ring moiety, wherein said five-membered or six-membered aryl or six-membered heteroaryl ring comprises two carbon atoms of the quinazoline ring to which  $R_3$ ,  $R_4$ , and  $R_5$  or  $R_6$ ,  $R_7$ ,  $R_8$ , and  $R_9$  are attached;

(g)  $R_{11}$  and  $R_{12}$  are independently selected from the group consisting of

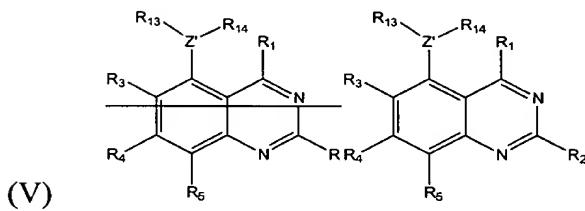
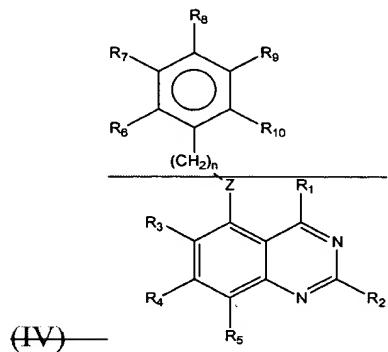
(i) hydrogen;

(ii) saturated or unsaturated alkyl; and

(h) Z' is carbon, oxygen, sulfur, or nitrogen and  $R_{13}$  and  $R_{14}$  taken together form a five-membered or six-membered heteroaryl ring with Z' as a ring member, wherein said ring

is optionally substituted with one, two, or three alkyl, halogen, trihalomethyl, carboxylate, and ester moieties.

12. (Amended) The method of claim 1, wherein said quinazoline-based compound has the formula set forth in formula **IV** or **V**:

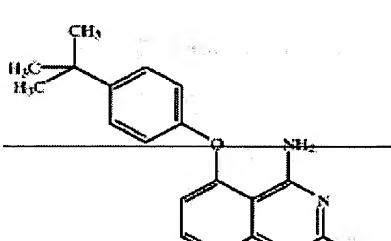
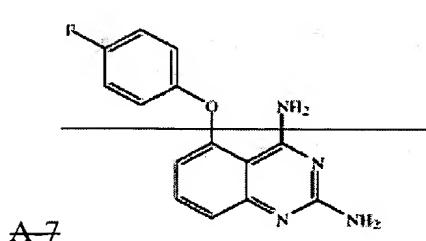
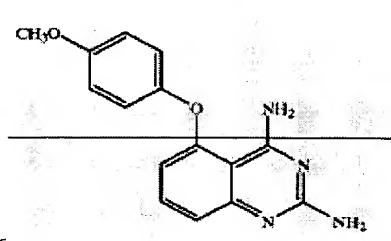
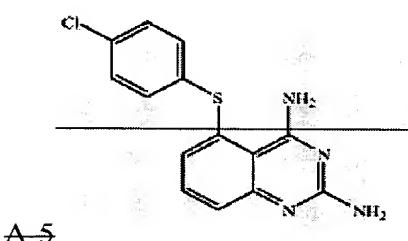
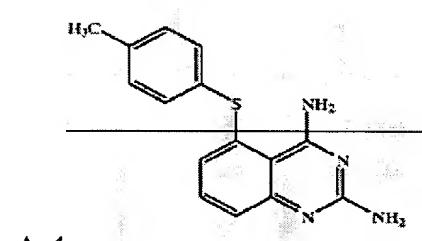
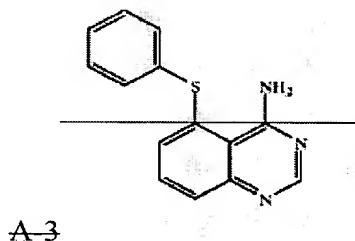
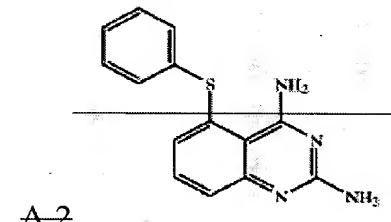
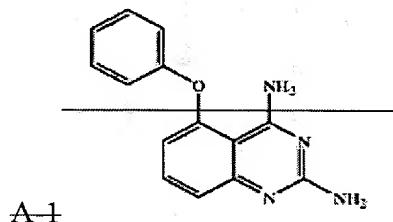


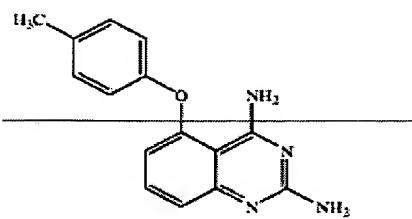
wherein:

- (a) Z is oxygen or sulfur;
- (b) n is 0 or 1;
- (c) R<sub>1</sub> and R<sub>2</sub> are independently selected from the group consisting of:
  - (i) hydrogen;
  - (ii) NX<sub>1</sub>X<sub>2</sub>, where X<sub>1</sub> and X<sub>2</sub> are independently selected from the group consisting of hydrogen and saturated or unsaturated alkyl;
  - (iii) benzyl;
- (d) R<sub>3</sub>, R<sub>4</sub>, and R<sub>5</sub> are independently selected from the group consisting of:
  - (i) hydrogen; and
  - (ii) saturated or unsaturated alkyl;
  - (iii) NX<sub>3</sub>X<sub>4</sub>, where X<sub>3</sub> and X<sub>4</sub> are independently selected from the group consisting of hydrogen and saturated or unsaturated alkyl; and
- (e) R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub>, R<sub>9</sub>, and R<sub>10</sub> are independently selected from the group consisting of

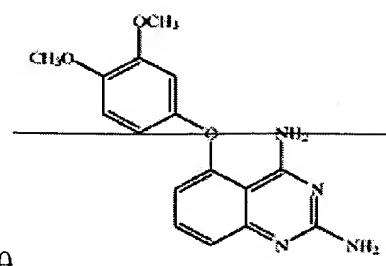
- \_\_\_\_ (i) hydrogen;
- \_\_\_\_ (ii) saturated or unsaturated alkyl;
- \_\_\_\_ (iii)  $NX_5X_6$ , where  $X_5$  and  $X_6$  are independently selected from the group consisting of hydrogen and saturated or unsaturated alkyl; and
- \_\_\_\_ (iv) halogen or trihalomethyl;
- \_\_\_\_ (v)  $C(X_7)_3$ , where  $X_7$  is selected from the group consisting of fluorine, chlorine, bromine, and iodine; and
- \_\_\_\_ (vi) methoxy;
- (f)  $R_{11}$  and  $R_{12}$  hydrogen; and
- (g)  $Z'$  is nitrogen and  $R_{13}$  and  $R_{14}$  taken together form a five-membered heteroaryl ring.

16. (Amended) The method of claim 1, wherein said quinazoline-based compound is selected from the group consisting of:

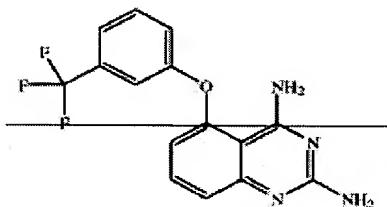




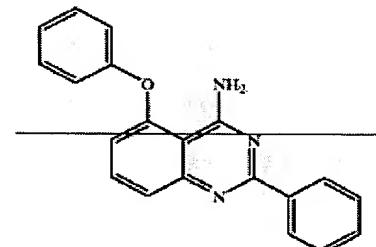
A-9



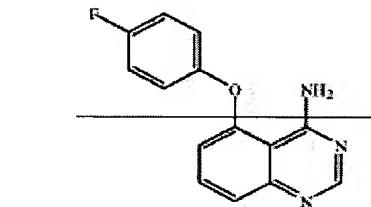
A-10



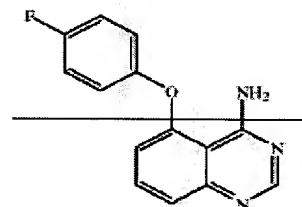
A-11



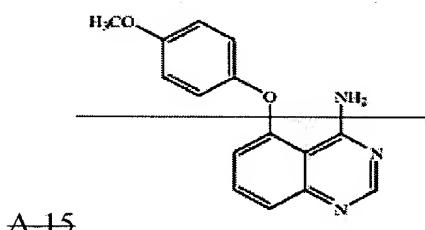
A-12



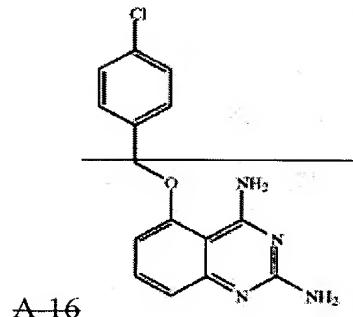
A-13



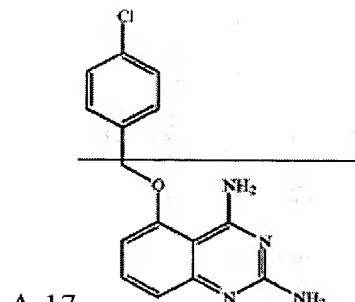
A-14



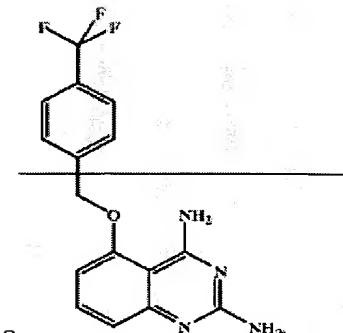
A-15



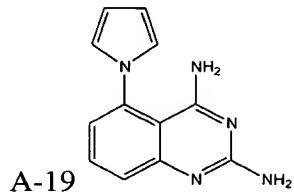
A-16



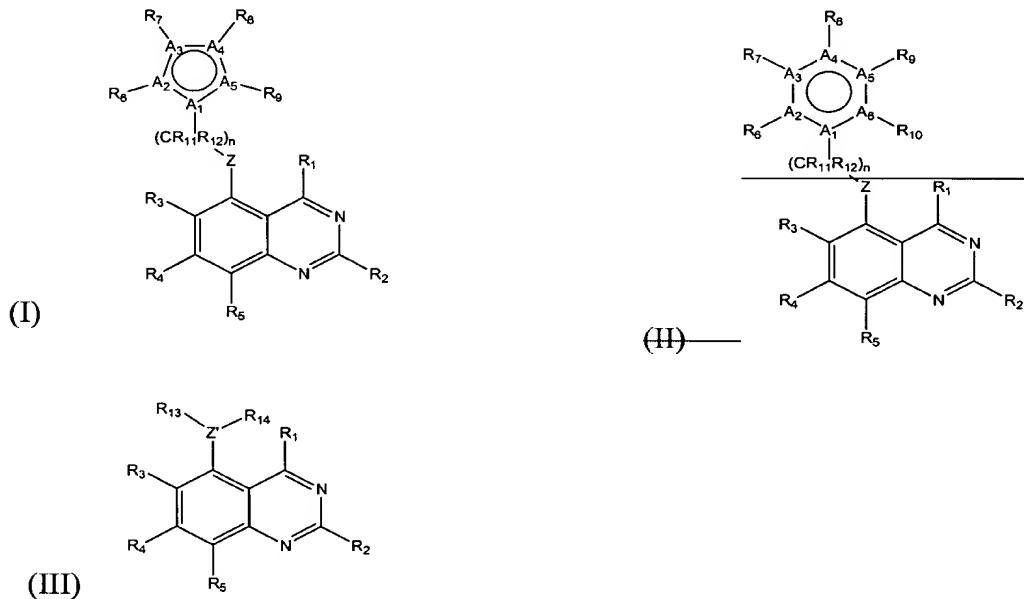
A-17



A-18



17. (Amended) A method of preventing or treating an abnormal condition in an organism, comprising the step of administering a quinazoline-based compound of formula I, II, or III to said organism:



wherein:

(a) Z is oxygen, NX<sub>1</sub>, or sulfur, where X<sub>1</sub> is selected from the group consisting of hydrogen, saturated or unsaturated alkyl, and five-membered or six-membered heteroaryl or six-membered aryl ring moieties;

(b) n is 0, 1, 2, 3, or 4;

(c) A<sub>1</sub>, A<sub>2</sub>, A<sub>3</sub>, A<sub>4</sub>, and A<sub>5</sub> are independently selected from the group consisting of carbon, nitrogen, oxygen, and sulfur,

provided that if any of A<sub>1</sub>, A<sub>2</sub>, A<sub>3</sub>, A<sub>4</sub> and A<sub>5</sub> is nitrogen, oxygen, or sulfur, said A<sub>1</sub>, A<sub>2</sub>, A<sub>3</sub>, A<sub>4</sub> and A<sub>5</sub> is not substituted with R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub> or R<sub>9</sub>;

(d) R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub>, and R<sub>10</sub> are independently selected from the group consisting of:

- (i) hydrogen;
- (ii) saturated or unsaturated alkyl;

(iii)  $NX_2X_3$ , where  $X_2$  and  $X_3$  are independently selected from the group consisting of hydrogen, saturated or unsaturated alkyl, and five-membered or six-membered heteroaryl or six-membered aryl ring moieties;

(iv) halogen or trihalomethyl;

(v) a ketone of formula  $-CO-X_4$ , where  $X_4$  is selected from the group consisting of hydrogen, alkyl, and five-membered or six-membered heteroaryl or six-membered aryl ring moieties;

(vi) a carboxylic acid of formula  $-(X_5)_{n5}-COOH$  or ester of formula  $-(X_6)_{n6}-COOX_7$ , where  $X_5$ ,  $X_6$ , and  $X_7$  and are independently selected from the group consisting of alkyl and five-membered or six-membered heteroaryl or six-membered aryl ring moieties and where  $n5$  and  $n6$  are each independently 0 or 1;

(vii) an alcohol of formula  $-(X_8)_{n8}-OH$  or an alkoxy moiety of formula  $-(X_8)_{n8}-OX_9$ , where  $X_8$  and  $X_9$  are independently selected from the group consisting of alkyl and five-membered or six-membered heteroaryl or six-membered aryl ring moieties and where  $n8$  is 0 or 1, and where said ring moieties are optionally substituted with one or more substituents selected from the group consisting of alkyl, halogen, trihalomethyl, carboxylate, and ester;

(viii)  $-NHCOX_{10}$ , where  $X_{10}$  is selected from the group consisting of alkyl, hydroxyl, and five-membered or six-membered heteroaryl or six-membered aryl ring moieties, wherein said ring moieties are optionally substituted with one or more substituents selected from the group consisting of alkyl, halogen, trihalomethyl, carboxylate, and ester;

(ix)  $-SO_2NX_{11}X_{12}$ , where  $X_{11}$  and  $X_{12}$  are selected from the group consisting of hydrogen, alkyl, and five-membered or six-membered heteroaryl or six-membered aryl ring moieties; and

(x) a five-membered or six-membered heteroaryl or six-membered aryl ring moiety optionally substituted with one or more substituents selected from the group consisting of alkyl, halogen, trihalomethyl, carboxylate, and ester moieties;

(e) any adjacent  $R_3$ ,  $R_4$ , and  $R_5$  or any adjacent  $R_6$ ,  $R_7$ ,  $R_8$ , and  $R_9$  are fused together to form a five-membered or six-membered heteroaryl or six-membered aryl ring moiety, wherein said five-membered or six-membered heteroaryl or six-membered aryl ring comprises two carbon atoms of the quinozaline ring to which  $R_3$ ,  $R_4$ , and  $R_5$  or  $R_6$ ,  $R_7$ ,  $R_8$ , and  $R_9$  are attached; and

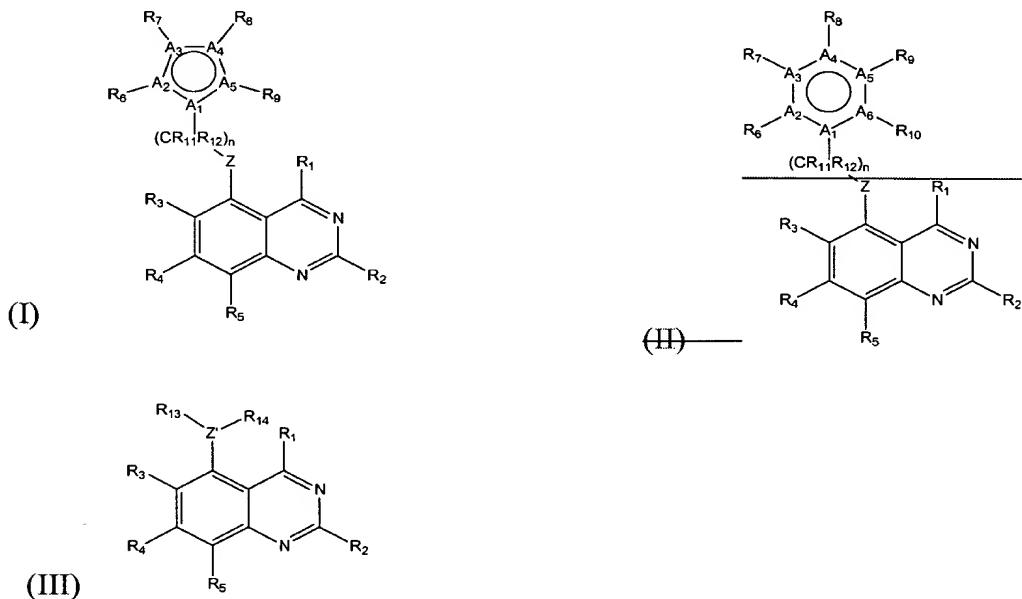
(f)  $R_{11}$  and  $R_{12}$  are independently selected from the group consisting of

(i) hydrogen;

(ii) saturated or unsaturated alkyl; and

(g) Z' is carbon, oxygen, sulfur, or nitrogen and R<sub>13</sub> and R<sub>14</sub> taken together form a five-membered or six-membered heteroaryl ring with Z' as a ring member.

26. (Amended) A quinazoline compound having the formula I, II, or III:



wherein:

(i) Z is oxygen, NX<sub>1</sub>, or sulfur, where X<sub>1</sub> is selected from the group consisting of hydrogen, saturated or unsaturated alkyl, and five-membered or six-membered heteroaryl or six-membered aryl ring moieties;

(ii) n is 0, 1, 2, 3, or 4;

(iii) A<sub>1</sub>, A<sub>2</sub>, A<sub>3</sub>, A<sub>4</sub>, and A<sub>5</sub>, and A<sub>6</sub> are independently selected from the group consisting of carbon, nitrogen, oxygen, and sulfur,

provided that if any of A<sub>1</sub>, A<sub>2</sub>, A<sub>3</sub>, A<sub>4</sub> and A<sub>5</sub> is nitrogen, oxygen, or sulfur, said A<sub>1</sub>, A<sub>2</sub>, A<sub>3</sub>, A<sub>4</sub> and A<sub>5</sub> is not substituted with R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub> or R<sub>9</sub>;

(iv) R<sub>1</sub> and R<sub>2</sub> are independently selected from the group consisting of:

(a) hydrogen;

(b) saturated or unsaturated alkyl;

(c) NX<sub>2</sub>X<sub>3</sub>, where X<sub>2</sub> and X<sub>3</sub> are independently selected from the group consisting of hydrogen and saturated or unsaturated alkyl; and

(d) halogen or trihalomethyl; and

(e) five-membered or six-membered heteroaryl ring moiety;

(v)  $R_3, R_4, R_5, R_6, R_7, R_8, \underline{R_9}$  and  $R_{10}$  are independently selected from the group consisting of:

- (a) hydrogen, provided that at least one of  $R_3, R_4, R_5, R_6, R_7, R_8, R_9$  and  $R_{10}$  is a non-hydrogen moiety if  $R_2$  is  $NH_2$ ;
- (b) saturated or unsaturated alkyl, wherein said  $R_8$  is not methyl when  $R_2$  is  $NH_2$  and when  $n = 1$ ;
- (c)  $NX_{132}X_{143}$ , where  $X_{132}$  and  $X_{143}$  are independently selected from the group consisting of hydrogen, saturated or unsaturated alkyl, and five-membered or six-membered aryl or heteroaryl ring moieties; and
- (d) halogen or trihalomethyl, wherein said  $R_8$  is not chlorine or fluorine when  $R_2$  is  $NH_2$  and when  $n = 1$ ;
- (e) a ketone of formula  $-CO-X_4$ , where  $X_4$  is selected from the group consisting of hydrogen, alkyl, and five-membered or six-membered heteroaryl or six-membered aryl ring moieties;
- (f) a carboxylic acid of formula  $-(X_5)_{n5}-COOH$  or ester of formula  $-(X_6)_{n6}-COOX_7$ , where  $X_5, X_6$ , and  $X_7$  are independently selected from the group consisting of alkyl and five-membered or six-membered heteroaryl or six-membered aryl ring moieties and where  $n5$  and  $n6$  are each independently 0 or 1;
- (g) an alcohol of formula  $-(X_8)_{n8}-OH$  or an alkoxy moiety of formula  $-(X_8)_{n8}-OX_9$ , where  $X_8$  and  $X_9$  are independently selected from the group consisting of alkyl and five-membered or six-membered heteroaryl or six-membered aryl ring moieties and where  $n8$  is 0 or 1, and where said ring moieties are optionally substituted with one or more substituents selected from the group consisting of alkyl, halogen, trihalomethyl, carboxylate, and ester;
- (h)  $-NHCOX_{10}$ , where  $X_{10}$  is selected from the group consisting of alkyl, hydroxyl, and five-membered or six-membered heteroaryl or six-membered aryl ring moieties, wherein said ring moieties are optionally substituted with one or more substituents selected from the group consisting of alkyl, halogen, trihalomethyl, carboxylate, and ester;
- (i)  $-SO_2NX_{11}X_{12}$ , where  $X_{11}$  and  $X_{12}$  are selected from the group consisting of hydrogen, alkyl, and five-membered or six-membered heteroaryl or six-membered aryl ring moieties; and
- (j) a five-membered or six-membered heteroaryl or six-membered aryl ring moiety optionally substituted with one or more substituents selected from the group consisting of alkyl, halogen, trihalomethyl, carboxylate, and ester moieties;

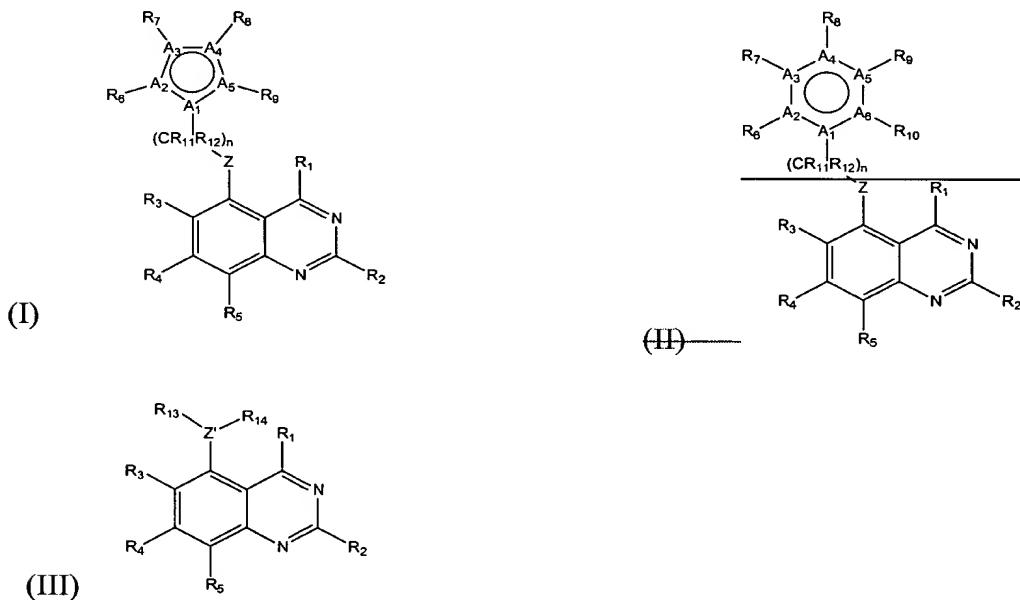
(vi) any adjacent R<sub>3</sub>, R<sub>4</sub>, and R<sub>5</sub> or any adjacent R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub>, and R<sub>9</sub> are fused together to form a five-membered or six-membered heteroaryl or six-membered aryl ring moiety, wherein said five-membered or six-membered heteroaryl or six-membered aryl ring comprises two carbon atoms of the quinozaline ring to which R<sub>3</sub>, R<sub>4</sub>, and R<sub>5</sub> or R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub>, and R<sub>9</sub> are attached;

(vii) R<sub>11</sub> and R<sub>12</sub> are independently selected from the group consisting of

- (i) hydrogen;
- (ii) saturated or unsaturated alkyl; and

(viii) Z' is carbon, oxygen, sulfur, or nitrogen and R<sub>13</sub> and R<sub>14</sub> taken together form a five-membered or six-membered heteroaryl ring with Z' as a ring member.

27. (Amended) A quinazoline compound having the formula I, II, or III:



wherein:

(a) Z is oxygen, NX<sub>1</sub>, or sulfur, where X<sub>1</sub> is selected from the group consisting of hydrogen, saturated or unsaturated alkyl;

(b) n is 0, 1, 2;

(c) A<sub>1</sub>, A<sub>2</sub>, A<sub>3</sub>, A<sub>4</sub>, and A<sub>5</sub> are independently selected from the group consisting of carbon, nitrogen, oxygen, and sulfur,

provided that if any of A<sub>1</sub>, A<sub>2</sub>, A<sub>3</sub>, A<sub>4</sub> and A<sub>5</sub> is nitrogen, oxygen, or sulfur, said A<sub>1</sub>, A<sub>2</sub>, A<sub>3</sub>, A<sub>4</sub> and A<sub>5</sub> is not substituted with R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub> or R<sub>9</sub>

(d)  $R_1$  and  $R_2$  are independently selected from the group consisting of:

- (i) hydrogen;
- (ii) saturated or unsaturated alkyl;
- (iii)  $NX_2X_3$ , where  $X_2$  and  $X_3$  are independently selected from the group consisting of hydrogen and saturated or unsaturated alkyl; and
- (iv) halogen or trihalomethyl; and
- (v) five-membered or six-membered heteroaryl ring moiety;

(e)  $R_3$ ,  $R_4$ ,  $R_5$ ,  $R_6$ ,  $R_7$ ,  $R_8$ , and  $R_9$  and  $R_{10}$  are independently selected from the group consisting of:

- (i) hydrogen, ~~provided that at least one of  $R_3$ ,  $R_4$ ,  $R_5$ ,  $R_6$ ,  $R_7$ ,  $R_8$ ,  $R_9$  and  $R_{10}$  is a non-hydrogen moiety if  $R_2$  is  $NH_2$~~ ;
- (ii) saturated or unsaturated alkyl, ~~wherein said  $R_8$  is not methyl when  $R_2$  is  $NH_2$  and when  $n = 1$~~ ;
- (iii)  $NX_4X_5$ , where  $X_4$  and  $X_5$  are independently selected from the group consisting of hydrogen and saturated or unsaturated alkyl; and
- (iv) halogen or trihalomethyl, ~~wherein said  $R_8$  is not chlorine or fluorine when  $R_2$  is  $NH_2$  and when  $n = 1$~~ ;
- (v)  $C(X_6)_3$ , where  $X_6$  is selected from the group consisting of fluorine, chlorine, bromine and iodine;
- (vi)  $-OX_7$ , where  $X_7$  is selected from the group consisting of hydrogen, saturated or unsaturated alkyl, and a five-membered or six-membered aryl or heteroaryl ring moiety;

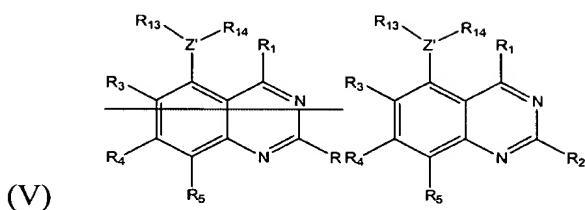
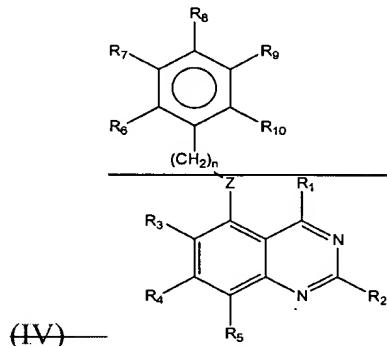
(f) any adjacent  $R_3$ ,  $R_4$ , and  $R_5$  or any adjacent  $R_6$ ,  $R_7$ ,  $R_8$ , and  $R_9$  and  $R_{10}$  are fused together to form a five-membered or six-membered aryl or heteroaryl ring moiety, wherein said five-membered or six-membered aryl or six-membered heteroaryl ring comprises two carbon atoms of the quinazoline ring to which  $R_3$ ,  $R_4$ , and  $R_5$  or  $R_6$ ,  $R_7$ ,  $R_8$ , and  $R_9$  are attached;

(g)  $R_{11}$  and  $R_{12}$  are independently selected from the group consisting of

- (i) hydrogen;
- (ii) saturated or unsaturated alkyl; and

(h)  $Z'$  is carbon, oxygen, sulfur, or nitrogen and  $R_{13}$  and  $R_{14}$  taken together form a five-membered or six-membered heteroaryl ring with  $Z'$  as a ring member, wherein said ring is optionally substituted with one, two, or three alkyl, halogen, trihalomethyl, carboxylate, and ester moieties.

28. (Amended) A quinazoline compound having the structure set forth in formula IV or V:



wherein:

- (a) Z is oxygen or sulfur;
- (b) n is 0 or 1;
- (c) R<sub>1</sub> and R<sub>2</sub> are independently selected from the group consisting of:
  - (i) hydrogen;
  - (ii) NX<sub>1</sub>X<sub>2</sub>, where X<sub>1</sub> and X<sub>2</sub> are independently selected from the group consisting of hydrogen and saturated or unsaturated alkyl;
  - (iii) benzyl;
- (d) R<sub>3</sub>, R<sub>4</sub>, and R<sub>5</sub> are independently selected from the group consisting of:
  - (i) hydrogen; and
  - (ii) saturated or unsaturated alkyl; and
  - (iii) NX<sub>3</sub>X<sub>4</sub>, where X<sub>3</sub> and X<sub>4</sub> are independently selected from the group consisting of hydrogen and saturated or unsaturated alkyl;
- (e) R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub>, R<sub>9</sub>, and R<sub>10</sub> are independently selected from the group consisting of

— (i) hydrogen provided that at least one of  $R_3$ ,  $R_4$ ,  $R_5$ ,  $R_6$ ,  $R_7$ ,  $R_8$ ,  $R_9$ , and  $R_{10}$  is a non-hydrogen moiety if  $R_2$  is  $\text{NH}_2$ ;

— (ii) saturated or unsaturated alkyl, wherein said  $R_8$  is not methyl when  $R_2$  is  $\text{NH}_2$  and when  $n = 1$ ;

— (iii)  $\text{NX}_5\text{X}_6$ , where  $\text{X}_5$  and  $\text{X}_6$  are independently selected from the group consisting of hydrogen and saturated or unsaturated alkyl; and

— (iv) halogen or trihalomethyl, wherein said  $R_8$  is not chlorine or fluorine when  $R_2$  is  $\text{NH}_2$  and when  $n = 1$ ;

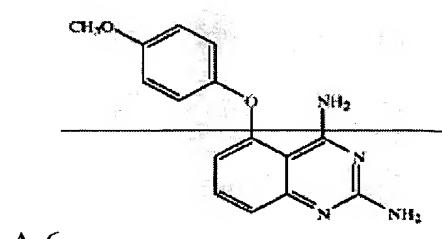
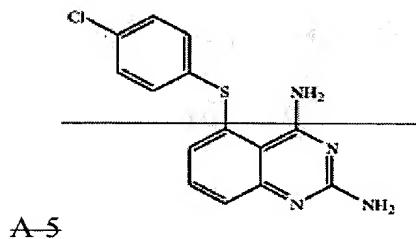
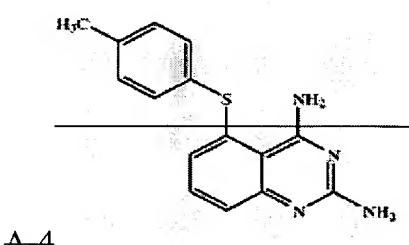
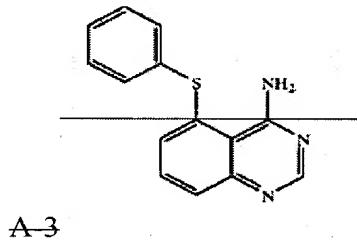
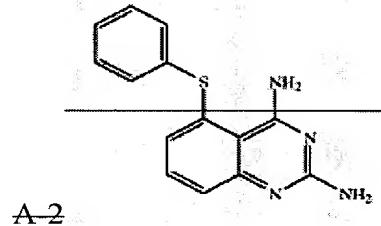
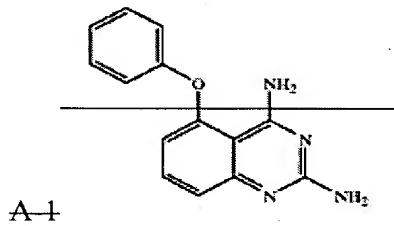
— (v)  $\text{C}(\text{X}_7)_3$ , where  $\text{X}_7$  is selected from the group consisting of fluorine, chlorine, bromine, and iodine; and

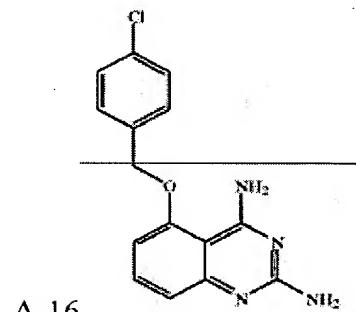
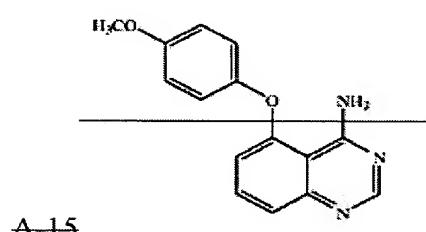
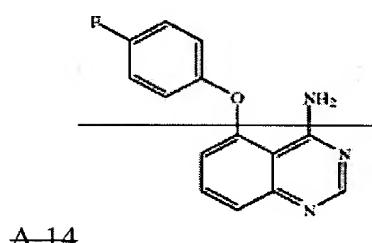
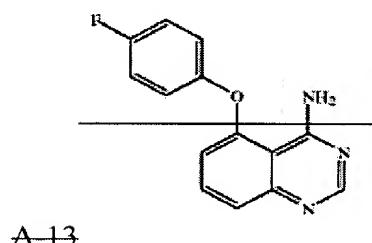
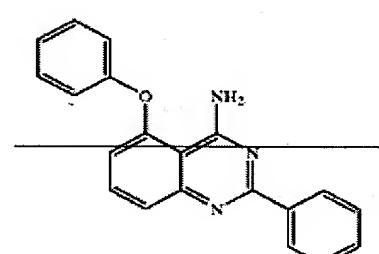
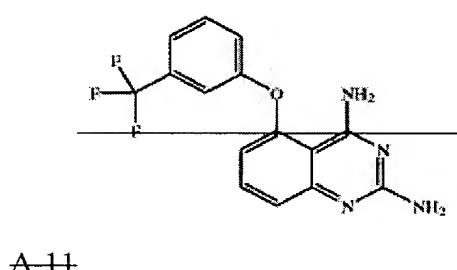
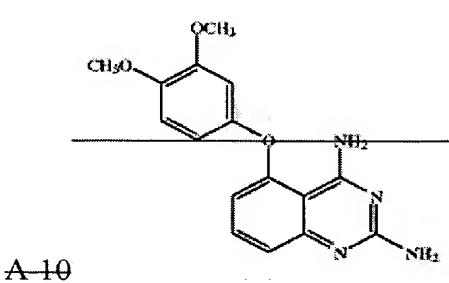
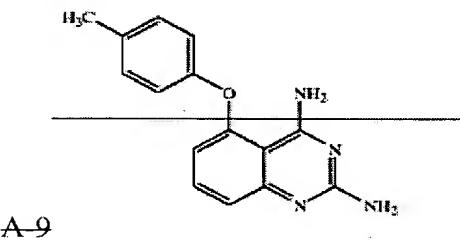
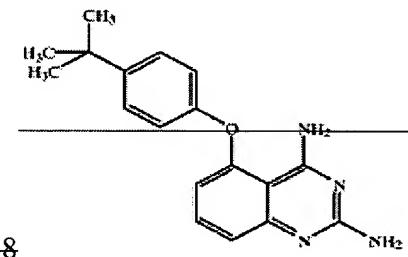
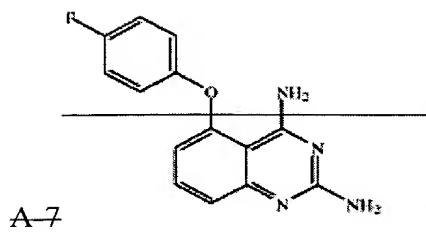
— (vi) methoxy;

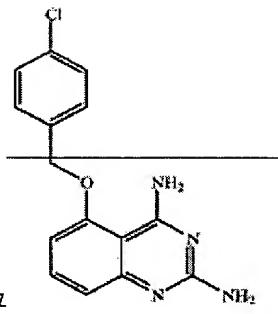
(f<sub>2</sub>)  $R_{11}$  and  $R_{12}$  hydrogen; and

(g<sub>2</sub>)  $Z'$  is nitrogen and  $R_{13}$  and  $R_{14}$  taken together form a five-membered heteroaryl ring.

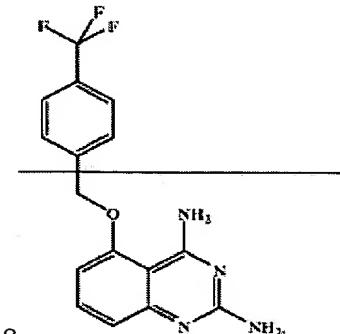
32. (Amended) A quinazoline compound which is selected from the group consisting of:



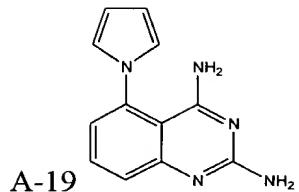




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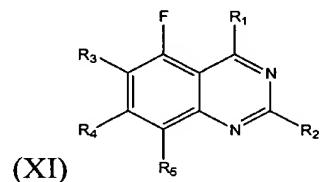


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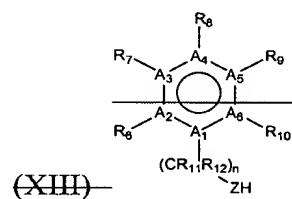
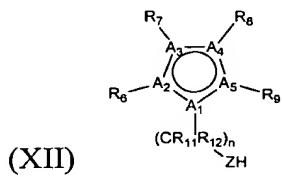
33. (Amended) A pharmaceutical composition comprising a quinazoline compound of any one of claims 26-32-26, 27, 31 or 32 or salt thereof, and a physiologically acceptable carrier or diluent.

34. (Amended) A method for synthesizing a compound of claim 26, comprising the steps of:

(a) reacting a first reactant with a second reactant to yield said compound, wherein said first reactant has a structure of formula XI:



and wherein said second structure has a structure of formula (XII) or (XIII):



wherein,

- (a) Z is oxygen or sulfur;
- (b) n is 0, 1, 2, 3, or 4;
- (c) A<sub>1</sub>, A<sub>2</sub>, A<sub>3</sub>, A<sub>4</sub>, and A<sub>5</sub> and A<sub>6</sub> are independently selected from the group consisting of carbon, nitrogen, oxygen, and sulfur,

provided that if any of A<sub>1</sub>, A<sub>2</sub>, A<sub>3</sub>, A<sub>4</sub> and A<sub>5</sub> is nitrogen, oxygen, or sulfur, said A<sub>1</sub>, A<sub>2</sub>, A<sub>3</sub>, A<sub>4</sub> and A<sub>5</sub> is not substituted with R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub> or R<sub>9</sub>;

- (d) R<sub>1</sub> and R<sub>2</sub> are independently selected from the group consisting of:
  - (i) hydrogen;
  - (ii) saturated or unsaturated alkyl;
  - (iii) NX<sub>2</sub>X<sub>3</sub>, where X<sub>2</sub> and X<sub>3</sub> are independently selected from the group consisting of hydrogen, saturated or unsaturated alkyl, and
  - (iv) halogen or trihalomethyl; and
  - (v) five-membered or six-membered heteroaryl ring moiety;

- (e) R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub>, and R<sub>9</sub> and R<sub>10</sub> are independently selected from the group consisting of:

- (i) hydrogen, provide that at least one of R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub>, R<sub>9</sub> and R<sub>10</sub> is a non-hydrogen moiety if R<sub>2</sub> is NH<sub>2</sub>;
- (ii) saturated or unsaturated alkyl, wherein said R<sub>8</sub> is not methyl when R<sub>2</sub> is NH<sub>2</sub> and when n = 1;
- (iii) NX<sub>2</sub><sub>13</sub>X<sub>143</sub>, where X<sub>132</sub> and X<sub>143</sub> are independently selected from the group consisting of hydrogen, saturated or unsaturated alkyl, and five-membered or six-membered aryl or heteroaryl ring moieties;
- (iv) halogen or trihalomethyl, wherein said R<sub>8</sub> is not chlorine or fluorine when R<sub>2</sub> is NH<sub>2</sub> and when n = 1;
- (v) a ketone of formula -CO-X<sub>4</sub>, where X<sub>4</sub> is selected from the group consisting of hydrogen, alkyl, and five-membered or six-membered heteroaryl or six-membered aryl ring moieties;
- (vi) a carboxylic acid of formula -(X<sub>5</sub>)<sub>n5</sub>-COOH or ester of formula -(X<sub>6</sub>)<sub>n6</sub>-COOX<sub>7</sub>, where X<sub>5</sub>, X<sub>6</sub>, and X<sub>7</sub> and are independently selected from the group consisting of alkyl and five-membered or six-membered heteroaryl or six-membered aryl ring moieties and where n<sub>5</sub> and n<sub>6</sub> are 0 or 1;
- (vii) an alcohol of formula -(X<sub>8</sub>)<sub>n8</sub>-OH or an alkoxy moiety of formula -(X<sub>8</sub>)<sub>n8</sub>-OX<sub>9</sub>, where X<sub>8</sub> and X<sub>9</sub> are independently selected from the group consisting of alkyl

and five-membered or six-membered heteroaryl or six-membered aryl ring moieties and where  $n_8$  is 0 or 1, and where said ring moieties are optionally substituted with one or more substituents selected from the group consisting of alkyl, halogen, trihalomethyl, carboxylate, and ester;

(viii)  $-\text{NHCOX}_{10}$ , where  $X_{10}$  is selected from the group consisting of alkyl, hydroxyl, and five-membered or six-membered heteroaryl or six-membered aryl ring moieties, wherein said ring moieties are optionally substituted with one or more substituents selected from the group consisting of alkyl, halogen, trihalomethyl, carboxylate, and ester;

(ix)  $-\text{SO}_2\text{NX}_{11}\text{X}_{12}$ , where  $X_{11}$  and  $X_{12}$  are selected from the group consisting of hydrogen, alkyl, and five-membered or six-membered heteroaryl or six-membered aryl ring moieties; and

(x) a five-membered or six-membered heteroaryl or six-membered aryl ring moiety optionally substituted with one or more substituents selected from the group consisting of alkyl, halogen, trihalomethyl, carboxylate, and ester moieties;

(f) any adjacent  $R_3$ ,  $R_4$ , and  $R_5$  or any adjacent  $R_6$ ,  $R_7$ ,  $R_8$ , and  $R_9$ , and  $R_{10}$  are fused together to form a five-membered or six-membered aryl or heteroaryl ring wherein said five-membered or six-membered aryl or heteroaryl ring comprises two carbon atoms of the quinazoline ring to which  $R_3$ ,  $R_4$ , and  $R_5$  or  $R_6$ ,  $R_7$ ,  $R_8$ , and  $R_9$  are attached;

(g)  $R_{11}$  and  $R_{12}$  are independently selected from the group consisting of

- (i) hydrogen; and
- (ii) saturated or unsaturated alkyl; and

(b) collecting a precipitate comprising said compound.

37. (Amended) The method of any one of claims 34, 35, or 36 wherein said first reactant and said second reactant are mixed in one or more solvents selected from the group consisting of dimethyl sulfoxide, potassium tert-butoxide, and sodium hydride.